Appendix A

Field Groundwater Purge and Sample Forms

March 2005 Monitoring Event

Groundwater Purge and Sample Form Date: 3/8/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L-87-1

PROJECT NUMBER: 05960216 PERSONNEL: SCK, JST

STATIC WATER LEVEL (FT): 28.47 MEASURING POINT DESCRIPTION: toc

WATER LEVEL MEASUREMENT METHOD: Solinist w.l. probe PURGE METHOD: bailer

TIME START PURGE: 1140 PURGE DEPTH (FT) ~30 ft

TIME END PURGE: 1230

TIME SAMPLED: 1140

COMMENTS:

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	CASING VOLUME (GAL)
	34.30		28.47		5.83		0.16	0.64	1.44		0.93

3 x 0.93 ≈ 3 ga.

TIME	1142	1219					
VOLUME PURGED (GAL)							
PURGE RATE (GPM)							
TEMPERATURE (°C)	13.24	13.24					
pH	6.32	7.54					
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	473	434					
DISSOLVED OXYGEN (mg/L)	8.43	7.50					
eH(MV)Pt-AgCl ref.	206.0	154.3					
TURBIDITY/COLOR	clear	lt brown					
ODOR		none					
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)		~30					
NUMBER OF CASING VOLUMES REMOVED		3					
DEWATERED?		no					

Groundwater Purge and Sample Form Date: 3/8/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L-87-1

PROJECT NUMBER: 059602 1.16 PERSONNEL: Sck jst

SAMPLE DATA:

TIME SAMPLED: 1140 COMMENTS:

DEPTH SAMPLED (FT): ~30ft

SAMPLING EQUIPMENT: bail then pump w/ peristalic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amber	H_2SO_4	N	2-L	mod	lt brown	yes	EPH Screen	
	3	VOA	HCl	N	3-40mL	mod			VPH	
	1	500 poly	H_2SO_4	N	500 mL	mod	lt brown	yes	Nitrate/Nitrite 353.2 Ammonia 350.3	
	1	500 poly	unpre	N	500 mL	mod			Sulfate 300.0	
	1	500 poly	HNO_3	Y	500 mL	mod	lt brown	yes	Iron 200.7	
	Hach			y				in field		Fe - 0.19 mg/L
	Hach			y						S - 0.00 mg/L

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 3 COMMENTS:

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: partly cloudy / very windy

TEMPERATURE (SPECIFY °C OR °F): ~50°F

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? peristalic did not work; bailed first for NA; filtered w peristatic directly from bailer; bailed 3 casing volumes then sampled for EPH + VPH

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/11/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L-87-7

PROJECT NUMBER: 059602L*16 PERSONNEL: Sck, jst

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: L-87-7a before purging - Sample all

DEPTH SAMPLED (FT): _____ L-87-7b after purging - EPH+VPH only

SAMPLING EQUIPMENT: bladder pump

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
2-	2	Amb	H_2SO_4	N	2-1L				EPH Screen	
		VOA	~~HCl~~ VOA	N	3-40	clear	clear	yes	VPH	
		poly	kp H_2SO_4	N	500	clear	clear	yes	N+N 353.2 NH_3 350.2	
		poly	unpre	N	500				Sulfate 300.0	
		poly	HNO_3	Y/S	500	clear	clear	yes	Iron	200.7
									Ferrous Iron Sulfide	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): _____ COMMENTS: _____

DISPOSAL METHOD: drum _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: cloudy + windy

TEMPERATURE (SPECIFY °C OR °F): 50

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/11/65 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L-87-7

PROJECT NUMBER: 059602L*16 PERSONNEL: Sch, jst

STATIC WATER LEVEL (FT): _____ MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst water level probe PURGE METHOD: bladder pump

TIME START PURGE: — PURGE DEPTH (FT) _____

TIME END PURGE: — _____

TIME SAMPLED: — _____

COMMENTS: Did not sample j. Could not sample past the product

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	1.5 CASING VOLUME (GAL)
	28.40		25.1		3.3		0.16	0.64	1.44		.52

TIME	1834						
VOLUME PURGED (GAL)							
PURGE RATE (GPM)							
TEMPERATURE (°C)	10.63						
pH	7.45						
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	563						
DISSOLVED OXYGEN (mg/L)	3.35						
eH(MV)Pt-AgCl ref.	43.9						
TURBIDITY/COLOR	sluten						
ODOR							
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)							
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

product 24.30
water 25.10

Groundwater Purge and Sample Form Date: 3/11/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: RW-8

PROJECT NUMBER: 05960 21 *16 PERSONNEL: SCK, JST

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: RW-8a before pursing - sample all

DEPTH SAMPLED (FT): 26~ RW-8b after pursing - EPH & VPH only

SAMPLING EQUIPMENT: peristaltic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
2 —	2	Amb	H_2SO_4	N	2-1L				EPH Screen	
2 —	3	VOA	HCl	N	3-40	Clear	clear	yes	VPH	
	1	Poly	H_2SO_4	N	500	Clear	Clear	yes	N+N 353.2 NH_3 350.3	
	1	poly	un-pre	N	500				Sulfate 300.0	
	1	poly	HNO_3	yes	500	Clear	clear	yes	Iron 200.7	
	Hach	filtered						in field	Ferrious Iron 0.00 Sulfide 0.00	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 35.5 COMMENTS: _____

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: sunny to cloudy ; windy

TEMPERATURE (SPECIFY °C OR °F): 60

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? no

cc: Project Manager: _____
Job File: _____
Other: _____

Groundwater Purge and Sample Form Date: 3/11/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: RW-8 (RW-8a, RW-8b)

PROJECT NUMBER: _____ PERSONNEL: _____

STATIC WATER LEVEL (FT): 22.92 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: solinst water level PURGE METHOD: peristalic pump

TIME START PURGE: 1200 PURGE DEPTH (FT) ~26

TIME END PURGE: _____

TIME SAMPLED: a- 1145 b-

COMMENTS: screen volume x 3 = 26 gallon; bottom blank (35.60 - 29) x 1 = 9.5 total 35.5 gal
(29 - 22.92)

first samples - RW-8a second samples RW-8b

22.92 product 24.30 water

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	3 X CASING VOLUME (GAL)
	35.60		22.92		—		0.16	0.64	1.44		35.5

TIME	1143	1158	1205	1245	1345	~~1430~~ 1500	1647
VOLUME PURGED (GAL)	before sample	after sample		5.9 +8	13.86 +1	~~19.81~~ 23.77 +1	35.5
PURGE RATE (GPM)			0.500	0500	0.500	0.500	0.500
TEMPERATURE (°C)	1815	1411	13.09	13.27	13.36	12.77	12.07
pH	6.41	7.16	6.98	6.97	6.98	6.98	6.99
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	627	602	604	597	598	592	588
DISSOLVED OXYGEN (mg/L)	4.21	3.15	2.07	2.49	4.08	1.98	3.19
eH(MV)Pt-AgCl ref.	197.3	147.7	125.3	82.8	81.2	83.3	111.5
TURBIDITY/COLOR	clear	clear	clear	clear	clear	clear	clear
ODOR	no	no	no	no	no	no	no
DEPTH OF PURGE INTAKE (FT)	~26	~24	~27	~27	~27	~27	~27
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—	—	—	—
NUMBER OF CASING VOLUMES REMOVED	—	—	—	—	—	—	—
DEWATERED?	no	no	no	no	no	no	no

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: HRO-23

PROJECT NUMBER: 059602116 PERSONNEL: sck, jst

SAMPLE DATA:

TIME SAMPLED: 1805 COMMENTS: All samples collected after 3 casing volumes

DEPTH SAMPLED (FT): ~25

SAMPLING EQUIPMENT: peristaltic

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amb	H_2SO_4	N	2-L				EPH Screen	
	3	VOA	HCl	N	3-40 ~~Clear~~	Clear	Clear	yes	VPH	
	1	poly	H_2SO_4	N	500				N+N 353.2	
	1	poly	un-prc.	N	500 ~~Clear~~	Clear	Clear	yes	NH_3 350.3 Sulfate 200.0	
	1	poly	HNO_3	yes	~~Clear~~ 500	Clear	Clear	yes	Iron	200.7
	Hach	- filtered						in field	Ferrious Iron 0.00 Sulfide 0.00	

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1.5 COMMENTS:

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: mostly sunny & windy

TEMPERATURE (SPECIFY °C OR °F): 50

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: HRO-23

PROJECT NUMBER: 059602L*16 PERSONNEL: SCK, JST

STATIC WATER LEVEL (FT): 24.66 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst water level PURGE METHOD: peristaltic pump

TIME START PURGE: 1750 PURGE DEPTH (FT) ~25

TIME END PURGE: 1805

TIME SAMPLED: 1805

COMMENTS: All samples collected after purging 3 casing volumes

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	1 CASING VOLUME (GAL)
	26.79		24.66		2.13		(0.16)	0.64	1.44		0.34

TIME	1750	1755	1800	1805			
VOLUME PURGED (GAL)	—	0.33	0.66	0.1			
PURGE RATE (GPM)	—	0.250	0.250	0.250			
TEMPERATURE (°C)	11.05	11.10	11.09	11.08			
pH	7.33	7.36	7.28	7.24			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	574	572	569	568			
DISSOLVED OXYGEN (mg/L)	2.93	2.78	2.61	2.55			
eH(MV)Pt-AgCl ref.	149.3	143.1	152.6	150.1			
TURBIDITY/COLOR	Clear	Clear	Clear	Clear			
ODOR	—	—	—	—			
DEPTH OF PURGE INTAKE (FT)	~25	~25	~25	~25			
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—			
NUMBER OF CASING VOLUMES REMOVED				3			
DEWATERED?	no	no	no	no			

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L-87-6

PROJECT NUMBER: 059602116 PERSONNEL: SCK; JST

SAMPLE DATA:
TIME SAMPLED: 1630 COMMENTS: ORP increased ∴ sampled for

DEPTH SAMPLED (FT): 27 NA filtered & non filtered; purged

SAMPLING EQUIPMENT: peristaltic 3 casing then sampled EPH+VPH

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amb	H_2SO_4	N	2-1L				EPH Screen	
	3	VOA	HCl	N	3-40			yes	VPH	
	1	poly	H_2SO_4	N	500				N+N 353.2	
	1	poly	un-pre	N	500			yes	NH_3 350.3	
									Sulfate 300.0	
	1	poly	HNO_3	yes	500			yes	Iron 200.7	
	Hach - filtered							In field	Ferrous Iron 0.00	
									Sulfate 0.01	

PURGE WATER DISPOSAL NOTES:
TOTAL DISCHARGE (GAL): 2 COMMENTS:

DISPOSAL METHOD: Drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:
WEATHER CONDITIONS: mostly sunny & windy

TEMPERATURE (SPECIFY °C OR °F): 55

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L-87-6

PROJECT NUMBER: 059602L*16 PERSONNEL: sch, jst

STATIC WATER LEVEL (FT): 25.70 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: solinst water level probe PURGE METHOD: Peristaltic

TIME START PURGE: 1629 PURGE DEPTH (FT) ~27

TIME END PURGE: 1712

TIME SAMPLED: 1630

COMMENTS: ORP dropped from 244.3 to 65.9 within moments; stopped and sampled NA filtered + nonfiltered; purged 3 casing then sampled FPH + VPH

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	1.5 CASING VOLUME (GAL)
	28.80		25.70		3.1		(0.16)	0.64	1.44		0.496

TIME	1629	1642	1647	1652	1702	1712	
VOLUME PURGED (GAL)	—	—	—	0.52	1.05	1.58	
PURGE RATE (GPM)	—	0.200	0.200	0.200	0.200	0.200	
TEMPERATURE (°C)	12.77	12.08	11.91	11.55	11.66	11.55	
pH	7.73	7.60	7.18	7.11	7.09	7.08	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	650	655	649	644	645	644	
DISSOLVED OXYGEN (mg/L)	4.64	5.83	0.95	0.89	1.00	0.89	
eH(MV)Pt-AgCl ref.	244.3	65.9	77.9	90.3	91.8	91.0	90.2
TURBIDITY/COLOR	clear	clear	clear	clear	clear	clear	
ODOR	—	—	—	—	—	—	
DEPTH OF PURGE INTAKE (FT)	~27	~27	~27	~27	~27	~27	
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—	—	—	
NUMBER OF CASING VOLUMES REMOVED	—	—	—	1	—	—	
DEWATERED?	no	no	no	no	no	no	

Sampled

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: Livingston - BNSF WELL NUMBER: L-88-9

PROJECT NUMBER: 059602 1*16 PERSONNEL: SCK JSL

SAMPLE DATA:
TIME SAMPLED: 1305 COMMENTS: All samples collected after 3 casing volumes

DEPTH SAMPLED (FT): ~ 27

SAMPLING EQUIPMENT: peristalic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amb	H_2SO_4	N	2 L	Clear	Clear	yes	EPH Screen	
	3	VOA	HCl	N	3-40ml				VPH	
	1	poly	H_2SO_4	N	500	Clear	Clear	yes	N+N 353.2	
	1	poly	Un-pre.	N	500				NH_3 350.3	
									sulfate 300.0	
	1	poly	HNO_3	yes	500	Clear	Clear	yes	Iron	200.7
	Hach - filtered							in field	Ferrous Iron	0.00
									Sulfide	0.00

PURGE WATER DISPOSAL NOTES:
TOTAL DISCHARGE (GAL): 3.25 COMMENTS:

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:
WEATHER CONDITIONS: partly cloudy

TEMPERATURE (SPECIFY °C OR °F): 55

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L-88-9

PROJECT NUMBER: 059602 1*16 PERSONNEL: Sck, jst

STATIC WATER LEVEL (FT): MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD: Peristaltic

TIME START PURGE: 1222 PURGE DEPTH (FT) 27

TIME END PURGE: 1304

TIME SAMPLED: 1305

COMMENTS: Some bubbles from well; all samples collected after purging 3 casing volumes

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	3 CASING VOLUME (GAL)
	30.20		23.76		6.44		(0.16)	0.64	1.44		1.03

TIME	1224	1229	1234	1244	1254	1304	
VOLUME PURGED (GAL)	-	0.396	0.79	1.5	2.3	3.2	
PURGE RATE (GPM)	-	0.300	0.300	0.300	0.300	0.300	
TEMPERATURE (°C)	11.88	11.23	11.09 ~~11.14~~	11.07	11.12	11.04	
pH	7.76	7.47	7.40	7.37	7.38	7.34	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	555	548	548	547	549	547	
DISSOLVED OXYGEN (mg/L)	8.08	8.14	8.54	8.28	9.14	8.72	
eH(MV)Pt-AgCl ref.	33.2	49.3	51.3	52.4	52.1	54.8	
TURBIDITY/COLOR	clear	clear	clear	clear	clear	clear	
ODOR	-	-	-	-	-	-	
DEPTH OF PURGE INTAKE (FT)	27	27	27	27	27	27	
DEPTH TO WATER DURING PURGE (FT)	-	-	-	-	-	-	
NUMBER OF CASING VOLUMES REMOVED	-	-	-	-	-	3	
DEWATERED?	no	no	no	no	no	no	

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: Livingston - BNSF WELL NUMBER: LS-6

PROJECT NUMBER: 0596-021*16 PERSONNEL: sck jst

SAMPLE DATA:

TIME SAMPLED: 1025 COMMENTS: Sampled for NA first - purged then EPH + VPH

DEPTH SAMPLED (FT): 25

SAMPLING EQUIPMENT: peristaltic

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amb	H_2SO_4	N	2-L	Clear	Clear	yes	EPH Screen	
	3	VOA	HCl	N	3-40mL				VPH	
	1	poly	H_2SO_4	N	500	Clear	Clear	yes	N+N 353.2	
	1	poly	Un-pre	N	500				NH_3 350.3	
									Sulfate 300.0	
	1	poly	HNO_3	yes	500	Clear	Clear	yes	Iron 200.7	
	Hach - filtered							In field	Ferrous Iron	0.76
									Sulfide	0.03

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 COMMENTS:

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: partly cloudy + light wind

TEMPERATURE (SPECIFY °C OR °F): 54

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/10/05 **Kennedy/Jenks Consultants**

PROJECT NAME: Livingston - BNSF WELL NUMBER: LS-6

PROJECT NUMBER: 0596021*16 PERSONNEL: Sch, jst

STATIC WATER LEVEL (FT): 23.41 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Schust PURGE METHOD: peristalic

TIME START PURGE: 1024 PURGE DEPTH (FT) ~25

TIME END PURGE: 1052

TIME SAMPLED: 1025

COMMENTS: Sampled for NA filtered & nonfiltered @ 1025 - initial orp drop ~ 50 in a few seconds; sampled EPH & VPH after 3 casing volumes

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	1.3 CASING VOLUME (GAL)
	26.21		23.41		2.8		0.16	0.64	1.44		0.448

TIME	1025	1038	1042	1047	1052		
VOLUME PURGED (GAL)	-	-	0.46	0.92	1.38		
PURGE RATE (GPM)	-	0.350	0.350	0.350	0.350		
TEMPERATURE (°C)	11.44	12.04	11.92	11.83	11.82		
pH	6.07	7.10	7.03	7.05	7.03		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	614	541	532	529	527		
DISSOLVED OXYGEN (mg/L)	2.23	4.19	0.43	0.37	1.24		
eH(MV)Pt-AgCl ref.	~~89~~ 120.0	-18.7	-42.7	-54.0	-59.6		
TURBIDITY/COLOR	clear	clear	clear	clear	clear		
ODOR	-	-	-	-	-		
DEPTH OF PURGE INTAKE (FT)	25	25	25	25	25		
DEPTH TO WATER DURING PURGE (FT)	-	-	-	-	-		
NUMBER OF CASING VOLUMES REMOVED	-	-	-	-	3		
DEWATERED?	no	no	no	no	no		

Sampled

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LG 13 ; MW-100

PROJECT NUMBER: 059602c*16 PERSONNEL: SCh, jst

SAMPLE DATA:

TIME SAMPLED: 11:15 ; 11:30 COMMENTS: all samples collected after purging

DEPTH SAMPLED (FT): ~ 22

SAMPLING EQUIPMENT: peristaltic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amber	H_2SO_4	N	2-L	clear	clear	yes	EPH Screen	
	3	VOA	HCl	N	3-40mL				VPH	
	1	500 poly	H_2SO_4	N	500 mL	Clear	clear	yes	N+N	353.2
	1	500 poly	upper	N	500 mL				NH_3	350.3
									Sulfate	300.0
	1	500 poly	HNO_3	Yes	500mL	clear	clear	yes	Iron	200.7
	Hach			Y				in field ↓		Fe 0.00 mg/L
	Hach			Y						S 0.00 mg/L

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2 COMMENTS:

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: Sunny & windy

TEMPERATURE (SPECIFY °C OR °F): 60°F

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? no

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LG-13 ; MW-100

PROJECT NUMBER: 0596021*16 PERSONNEL: Sch, jst

STATIC WATER LEVEL (FT): 20.07 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: 20.07 PURGE METHOD: peristatic pump

TIME START PURGE: ~~1040~~ 1053 PURGE DEPTH (FT) ~22

TIME END PURGE: 1115

TIME SAMPLED: 11:15, 11:30

COMMENTS: Duplicate sample collected; All bottles collected after purging

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	1.59 CASING VOLUME (GAL)
	23.40		20.07		3.33		0.16	0.64	1.44		0.53

TIME	1055	1100	1105	1110	1115		
VOLUME PURGED (GAL)							
PURGE RATE (GPM)	0.325	0.325	0.325	0.325	0.325		
TEMPERATURE (°C)	13.96	13.56	13.75	13.84	13.83		
pH	8.04	7.24	7.26	7.20	7.18		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	487	478	476	475	476		
DISSOLVED OXYGEN (mg/L)	7.86	7.26	7.24	5.80	5.54		
eH(MV)Pt-AgCl ref ~~205~~	135.6	168.8	168.8	165.6	166.2		
TURBIDITY/COLOR	clear	clear	clear	clear	clear		
ODOR	none	none	none	none	none		
DEPTH OF PURGE INTAKE (FT)	~22	~22	~22	~22	~22		
DEPTH TO WATER DURING PURGE (FT)	—	20.09	—	—	20.09		
NUMBER OF CASING VOLUMES REMOVED	—	—	—	—	3		
DEWATERED?	no	no	no	no	no		

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: L6-4

PROJECT NUMBER: 05960021 * 16 PERSONNEL: Sck, jst

SAMPLE DATA:

TIME SAMPLED: 1350 COMMENTS: All samples were collected after purging

DEPTH SAMPLED (FT): ~21

SAMPLING EQUIPMENT: peristalic

SAMPLE NO.	NO. OF CONTAINERS	CONTAINER TYPE	PRESERVATIVE	FIELD FILTRATION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUSTODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
2	~~Amb~~ 2	Amber	H_2SO_4	N	2-L	Clear	Clear	yes	EPH Screen	
3	3	VOA	HCl	N	3-40mL				VPH	
1	1	poly	H_2SO_4	N	500	Clear	Clear	yes	N+N	353.2
1	1	poly	un-pre	N	500				NH_3	350.3
									Sulfate	300.0
4	1	poly	HNO_3	yes	500	Clear	Clear	yes	Iron	200.7
	Hach - filtered							in field	Sulfide	Fe 0.00 S 0.01

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 11.5 COMMENTS: filtered

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: Sunny & windy

TEMPERATURE (SPECIFY °C OR °F): 64

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LG-4

PROJECT NUMBER: 05960216 PERSONNEL: Sck, jst

STATIC WATER LEVEL (FT): 20.46 MEASURING POINT DESCRIPTION: toc

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD: peristaltic

TIME START PURGE: 1332 PURGE DEPTH (FT) ~21

TIME END PURGE: 1348

TIME SAMPLED: 1350

COMMENTS: All samples collected after purging 3 casing volumes

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	0.64 CASING VOLUME (GAL)
	21.80		20.46		1.34		(0.16)	0.64	1.44		0.21

TIME	1335	1340	1345	1348			
VOLUME PURGED (GAL)			3	3+			
PURGE RATE (GPM)		0.275	.275	0.275			
TEMPERATURE (°C)	15.16	13.54	13.37	13.41			
pH	7.95	7.53	7.41	7.40			
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	499	475	471	470			
DISSOLVED OXYGEN (mg/L)	9.11	7.38	6.93	6.83			
eH(MV)Pt-AgCl ref.	92.6	95.3	97.5	98.4			
TURBIDITY/COLOR	mod/white	clear	clear	clear			
ODOR	no	no	no	no			
DEPTH OF PURGE INTAKE (FT)	~21	~21	~21	~21			
DEPTH TO WATER DURING PURGE (FT)	20.49			20.			
NUMBER OF CASING VOLUMES REMOVED	—	.36	0.64	0.94			
DEWATERED?	—	no	no				

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LG-12

PROJECT NUMBER: 05960021*16 PERSONNEL: SCK, JST

SAMPLE DATA:

TIME SAMPLED: 1505 COMMENTS: VA samples collected @ 1505; VPH & EPH collected after purging

DEPTH SAMPLED (FT): 20

SAMPLING EQUIPMENT: peristaltic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amber	H_2SO_4	N	2-L				EPH Screen	
	3	VOA	HCl	N	3-40mL	clear	clear	yes	VPH	
	1	poly	H_2SO_4	N	500				N+N	
	1	poly	un-pre	N	500	clear	clear	yes	NH_3	
	1	poly	HNO_3	yes	500	clear	clear	yes	Sulfate	
	Hach								Iron	
	Hach			y				in field		Ferrous iron 0.52 mg/L Sulfide 0.09 mg/L

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 1.5 COMMENTS: filtered

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: Sunny & Windy

TEMPERATURE (SPECIFY °C OR °F): 64

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? ORP dropped very quickly

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LG-12

PROJECT NUMBER: 059602i*16 PERSONNEL: Sck, jst

STATIC WATER LEVEL (FT): _____ MEASURING POINT DESCRIPTION: toc

WATER LEVEL MEASUREMENT METHOD: Solinst water level probe PURGE METHOD: peristaltic

TIME START PURGE: 1500 PURGE DEPTH (FT) 20

TIME END PURGE: 1526

TIME SAMPLED: 1505

COMMENTS: Sampled for NA filtered + nonfiltered @1505; sampled for VPH & EPH after purging

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	0.68 CASING VOLUME (GAL)
	21.25		19.82		1.43		(0.16)	0.64	1.44		0.22

TIME	1500	1505	1516	1521	1526		
VOLUME PURGED (GAL)		0.46		0.72	1.05		
PURGE RATE (GPM)		.350	0.200	0.200	0.250		
TEMPERATURE (°C)	15.06	13.40	13.72	13.21	13.13		
pH	7.43	6.88	7.32	6.77	6.77		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	653	695	394	691	690		
DISSOLVED OXYGEN (mg/L)	7.34	0.72	11.12	0.48	0.40		
eH(MV)Pt-AgCl ref.	89.0	-15.9	-29.1	-37.7	-38.1		
TURBIDITY/COLOR	hishy brow	clear	clear	clear	clear		
ODOR	none	~~sol~~ organic smell	organic smell	organic	organic		
DEPTH OF PURGE INTAKE (FT)	20	20	20	20	20		
DEPTH TO WATER DURING PURGE (FT)	—	—	—	—	—		
NUMBER OF CASING VOLUMES REMOVED	—	—	—	3+	—		
DEWATERED?	no	no	no	no	no		

Sampled

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LS-9

PROJECT NUMBER: 059602 1*16 PERSONNEL: Sck, jst

SAMPLE DATA:

TIME SAMPLED: _____ COMMENTS: _____

DEPTH SAMPLED (FT): _____

SAMPLING EQUIPMENT: Peristaltic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amb	H_2SO_4	N	2-L	clear	clear	yes	EPH Screen	
	3	VOA	HCl	N	3-40mL				VPH	
	1	poly	H_2SO_4	N	500	clear	clear	yes	N+N	353.2
	1	poly	un-pres	N	500				NH_3	350.3
									Sulfate	300.0
	1	poly	HNO_3	yes	500	clear	clear	yes	Iron	200.7
	Hach -		filtered					In field	Ferrous Iron	0.01
									Sulfide	0.00

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): 2.5 COMMENTS: _____

DISPOSAL METHOD: drum _____

DRUM DESIGNATION(S)/VOLUME PER (GAL): _____

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS: _____

GENERAL:

WEATHER CONDITIONS: Sunny & Windy

TEMPERATURE (SPECIFY °C OR °F): 60's

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING? _____

cc: Project Manager: _____

Job File: _____

Other: _____

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF-Livingston WELL NUMBER: LS-9

PROJECT NUMBER: 0596021*16 PERSONNEL: SCA; JST

STATIC WATER LEVEL (FT): _____ MEASURING POINT DESCRIPTION: toc

WATER LEVEL MEASUREMENT METHOD: Solinst water level probe PURGE METHOD: peristaltic

TIME START PURGE: 1642 PURGE DEPTH (FT) _____

TIME END PURGE: _____

TIME SAMPLED: 1730

COMMENTS: problems w/ degasing; all samples collected after purging 3 casing volumes

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	2.04 CASING VOLUME (GAL)
	27.40		23.15		4.25		0.16	0.64	1.44		0.68

TIME	1643	1648	1653	1703	1713	1723	
VOLUME PURGED (GAL)		0.26	0.52	1.05	1.58	2.11	
PURGE RATE (GPM)	0.20	0.20	0.20	0.20	0.20	0.20	
TEMPERATURE (°C)	14.59	12.09	11.84	11.67	11.69	11.61	
pH	7.61	7.31	7.23	7.05	7.04	7.20	
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	502	493	484	480	479	476	
DISSOLVED OXYGEN (mg/L)	9.8	6.87	6.80	6.89	8.28	6.72	
eH(MV)Pt-AgCl ref.	34.8	74.1	84.4	102.8	110.1	66.2	
TURBIDITY/COLOR	clear	clear	clear	clear	clear		
ODOR	-	-	-	-	-		
DEPTH OF PURGE INTAKE (FT)	25	25	25	25	25		
DEPTH TO WATER DURING PURGE (FT)	-	-	-	-	-		
NUMBER OF CASING VOLUMES REMOVED			1	1+	2+		
DEWATERED?	no	no	no	no			

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Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LG-5

PROJECT NUMBER: 0596021.16 PERSONNEL: Sch, jst

SAMPLE DATA:

TIME SAMPLED: 0920 COMMENTS: All samples collected after purging

DEPTH SAMPLED (FT): ~21

SAMPLING EQUIPMENT: peristalic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amber	H_2SO_4	N	2-L				EPA Screen	
	3	VOA	HCl	N	3-40mL	Clear	Clear	yes	VPH	
	1	poly	H_2SO_4	N	500	Clear			NO_3 NH_3	
	1	poly	un-pre	N	500		Clear	yes	Sulfate	
	1	poly	HNO_3	yes	500	clear	clear	yes	Iron	
	Hach			y				in field		F - 0.00 mg/L S - 0.00 mg/L

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): ~2 COMMENTS:

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: YES (NO)

COMMENTS:

GENERAL:

WEATHER CONDITIONS: Sunny & windy

TEMPERATURE (SPECIFY °C OR °F):

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/9/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: LG-5

PROJECT NUMBER: 059602L.16 PERSONNEL: Sch, jst

STATIC WATER LEVEL (FT): ~~22.1~~ 20.21 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst PURGE METHOD: peristaltic

TIME START PURGE: 0900 PURGE DEPTH (FT) ~21

TIME END PURGE: 0920

TIME SAMPLED: 0920

COMMENTS: All samples collected after 3 casing volumes.

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	1.29 CASING VOLUME (GAL)
	22.90		20.21		2.69		(0.16)	0.64	1.44		0.43

TIME	0900	0905	0910	0915	0920		
VOLUME PURGED (GAL)					1.45 gal		
PURGE RATE (~~GPM~~) L/m	0.275 L	0.275	0.275	0.275	0.275		
TEMPERATURE (°C)	11.23	11.88	11.99	11.97	11.99		
pH	6.13	6.75	7.00	7.07	7.10		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	506	490	486	484	484		
DISSOLVED OXYGEN (mg/L)	8.36	7.24	6.97	6.74	6.49		
eH(MV)Pt-AgCl ref.	203.6	195.7	186.4	183.5	181.7		
TURBIDITY/COLOR	lt brown	clear	clear	clear	clear		
ODOR							
DEPTH OF PURGE INTAKE (FT)	~21	~21	~21	~21	~21		
DEPTH TO WATER DURING PURGE (FT)	~		20.22		20.22		
NUMBER OF CASING VOLUMES REMOVED					3		
DEWATERED?	no	no	no	no	no		

Groundwater Purge and Sample Form Date: 3/8/05 **Kennedy/Jenks Consultants**

PROJECT NAME: BNSF - Livingston WELL NUMBER: 25-10

PROJECT NUMBER: 059602116 PERSONNEL: SCK, jst

SAMPLE DATA:

TIME SAMPLED: 1540 COMMENTS: Sampled for NA samples first; then finished purging; the collected VPH & EPH

DEPTH SAMPLED (FT): 27

SAMPLING EQUIPMENT: peristalic

SAMPLE NO.	NO. OF CONTAIN-ERS	CON-TAINER TYPE	PRESER-VATIVE	FIELD FILTRA-TION	VOLUME FILLED (ml or L)	TURBIDITY	COLOR	SHIPPED UNDER CHAIN-OF-CUS-TODY AT 4°C?	ANALYSIS REQUEST (METHOD)	COMMENTS
	2	Amber	H_2SO_4	N						
	3	VOA	HCl	N						
	1	500 pol	H_2SO_4	N						
	1	500 pol	Unpre	N						
	1	500 pol	HNO_3	Y						
	Hach			Y						Ferrous Iron 0.00
	Hach			Y						Sulfide 0.01

PURGE WATER DISPOSAL NOTES:

TOTAL DISCHARGE (GAL): ~3 COMMENTS:

DISPOSAL METHOD: drum

DRUM DESIGNATION(S)/VOLUME PER (GAL):

WELL HEAD CONDITIONS CHECKLIST (CIRCLE YES OR NO - IF NO, ADD COMMENTS):

WELL SECURITY DEVICES OK (BOLLARDS, CHRISTY LID, CASING LID AND LOCK)?: (YES) NO

INSIDE OF WELL HEAD AND OUTER CASING DRY?: (YES) NO

WELL CASING OK?: (YES) NO

COMMENTS:

GENERAL:

WEATHER CONDITIONS: partly cloudy

TEMPERATURE (SPECIFY °C OR (°F)): 50's

PROBLEMS ENCOUNTERED DURING PURGING OR SAMPLING?

cc: Project Manager:
Job File:
Other:

Groundwater Purge and Sample Form Date: 3/8 **Kennedy/Jenks Consultants**

PROJECT NAME: BUSF - Livingston WELL NUMBER: LS-10

PROJECT NUMBER: 059602I.16 PERSONNEL: Sck ; jst

STATIC WATER LEVEL (FT): 24.14 MEASURING POINT DESCRIPTION: TOC

WATER LEVEL MEASUREMENT METHOD: Solinst water probe PURGE METHOD: peristalic

TIME START PURGE: ~~2:40 pm~~ 251 PURGE DEPTH (FT) 27 ft

TIME END PURGE: 1540

TIME SAMPLED: ~~1450~~ 1540

COMMENTS: 3 casing = 2.5 gallons ; Sampled NA @ 1451 ; continue purge @ 1510

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN) 2	4	6	=	2.5 gall CASING VOLUME (GAL)
	29.30		24.14		5.16		(0.16)	0.64	1.44		0.82

TIME	251	310	315	320	325	330	340
VOLUME PURGED (GAL)				1+	1+1	2	2.5
PURGE RATE (GPM)		0.25l	0.3l	0.35l	0.325l	0.325l	0.325l
TEMPERATURE (°C)	13.74	13.20	12.75	12.71	12.66	12.57	12.60
pH	7.42	7.46	7.34	7.36	7.36	7.34	7.48
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	451	448	446	445	445	444	445
DISSOLVED OXYGEN (mg/L)	7.82	7.45	7.34	8.71	8.98	9.42	11.78
eH(MV)Pt-AgCl ref. -11 to	-6.6	51.7	61.3	64.1	71.8	77.8	80.3
TURBIDITY/COLOR		clear	clear	clear	clear	clear	clear
ODOR		none	none	none	none	none	none
DEPTH OF PURGE INTAKE (FT)		~27	~27	27	~27	~27	~27
DEPTH TO WATER DURING PURGE (FT)		~~27~~	~~27~~	~~27~~	~~27~~	~~27~~	~~27~~
NUMBER OF CASING VOLUMES REMOVED		-	-	-	-	-	3
DEWATERED?		NO	no	no	no	no	no

Sampled

June 2005 Monitoring Event

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/24/05
Weather: clear windy
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solinist
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 94-1
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 38
Screen Interval: 28 to 38
Top of Casing Elevation: 4452.09
Depth to Groundwater: 6.66
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL: NA
NAPL Thickness: NA

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/24/05 1400
pH	YSI Multi	↓
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	~~hach~~ "	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3
Sample @ 1615			

start

Parameter	0 Mins 1549	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.5L/m	0.5L/m	0.5L/m	0.5L/m	0.5L/m				1615
Water Depth		6.59	6.60	6.61	6.63				
Temperature		9.38	9.82	9.83	9.86				
pH		6.42	6.74	6.88	6.89				
Sp. Conductance		246	250	250	251				
DO		—	—						
Eh		+13							
ORP		+138	+132	+131	+129				
Turbidity		14.0	11.4	13.4	13.1				

Notes: water level fluctuates
DO meter not working

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/25/05
Weather: clear wind 75
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solonist
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 94-2
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 39.2
Screen Interval: 29.2 to 39.2
Top of Casing Elevation: 4459.05
Depth to Groundwater: 4.27
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL: —
NAPL Thickness: —

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/25/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3
Sample @ 0930			

start @ 0906

Parameter	0 Mins 1 min	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate L/min	0.5	0.4	0.4	0.4	0.4				0930
Water Depth	4.28	4.29	4.29	4.28	4.28				
Temperature	10.98	10.56	10.59	10.58	10.61				
pH	6.43	6.36	6.48	6.57	6.59				
Sp. Conductance	288	290	290	291	291				
DO	6.23	4.01	3.54	3.87	3.67				
Eh									
ORP	+154	162.0	157.8	+151	+159				
Turbidity		1.1	2.1	1.6	1.7				

Notes: Sample @ 0930 VOCs 524.2
visit by bnsf.

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date:	06/25/05	Well Number:	92-2
Weather:	clear light wind	Monument Type:	Above Ground
Project Name:	BNSF - Livingston	Well Diameter:	2 inches
Project Number:	0596021.16	Total Casing Depth:	27
Sampling Personnel:	mlg, jst	Screen Interval:	17 to 27
Water Level Indicator:	solonist	Top of Casing Elevation:	4461.29
Purging Method:	Minimal Drawdown	Depth to Groundwater:	4.61
Sampling Method:	as above	Groundwater Elevation:	
Sampling Device:	Bladder Pump	Wet Casing Volume:	
Pump Intake Depth:		Depth to NAPL:	–
Water Disposal:	Drums	NAPL Thickness:	–

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/25
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:

2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft

6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

Sample 1030

Start to 1001

Parameter	0 Mins 2 min	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.5	0.5	0.5	0.5	0.5				1030
Water Depth	4.60	4.60	4.59	4.61	4.60				
Temperature	8.91	9.18	9.04	9.33	9.34				
pH	6.89	6.84	6.84	6.84	6.84				
Sp. Conductance	351	348	405	406	409				
DO	1.70	1.61	1.43	1.40	1.41				
Eh									
ORP	+156	+157	+153	+151	+149				
Turbidity	29.2	+23.3	22.1	27.3	13.1				

Notes: Sample 10:30 VOCs 8260

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/25/05
Weather: clear 80s
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-2
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 39
Screen Interval: 29 to 39
Top of Casing Elevation: 4483.09
Depth to Groundwater: 22.22
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL: —
NAPL Thickness: —

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/25 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3
Sample 1120			

Start @ 1058

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate L/M	0.4	0.35	0.4	0.4					1120
Water Depth	22.21	22.00	22.21	22.21					
Temperature	13.38	13.35	13.38	13.38					
pH	7.12	7.12	7.13	7.15					
Sp. Conductance	327	326	325	324					
DO	6.34	6.42	6.51	6.55					
Eh									
ORP	+139	+138	+138	+136					
Turbidity	28.8	3.5	2.8	2.8					

Notes: Sample @ 1120 VOC 524.2

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date:	06/25/05	Well Number:	L-88-10
Weather:	clear 80's	Monument Type:	Above Ground
Project Name:	BNSF - Livingston	Well Diameter:	2 inches
Project Number:	0596021.16	Total Casing Depth:	31
Sampling Personnel:	mlg, jst	Screen Interval:	21 to 31
Water Level Indicator:	solonist	Top of Casing Elevation:	4483.56
Purging Method:	Minimal Drawdown	Depth to Groundwater:	22.23/23.26 stick up
Sampling Method:	as above	Groundwater Elevation:	
Sampling Device:	Bladder Pump	Wet Casing Volume:	
Pump Intake Depth:		Depth to NAPL:	
Water Disposal:	Drums	NAPL Thickness:	

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/25 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers			
Analysis	**Bottle Type**	**Preservative**	**Number**
VOC - EPA 8260	VOA	HCL	3
Sample @ 1210			

start @ 1145

Parameter	0 Mins 2	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.3	0.3	0.3	0.4	0.3	0.3			12:10
Water Depth	23.27	23.27	23.27	23.27	23.27	23.27			
Temperature	13.52	13.83	13.27	13.25	13.25	13.27			
pH	7.23	6.94	6.87	6.86	6.87	6.86			
Sp. Conductance	522	527	516	518	510	515			
DO	2.40	1.01	1.20	1.70	0.95	1.10			
Eh									
ORP	+123	+120	+112	+109	+108	+109			
Turbidity	0.9	1.0	1.0	1.0	1.0	1.0			

Notes: Sample @ 1210 VOC 8260

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/25/05
Weather: clear 80s
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: none
Purging Method: well pump (centrifugal)
Sampling Method: @ tap
Sampling Device: Tap
Pump Intake Depth:
Water Disposal:

Well Number: Rainbow
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 24
Screen Interval: unknown
Top of Casing Elevation: 4465.99
Depth to Groundwater: not taken
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/25 0833
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3
Sample 1230			

1240

Parameter	0 Mins 2min	5 Mins	10 Mins 8	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate gpm	*10+	→	→	→					
Water Depth									
Temperature	10.20	10.12	10.18	10.19					
pH	7.16	7.01	7.00	7.00					
Sp. Conductance	435	433	433	433					
DO	2.45	1.68	1.70	1.71					
Eh									
ORP	+131	+136	+134	+133					
Turbidity	0	0	0	0					

Notes: * 5 gal / 36 sec.

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/25/05
Weather: cloudy thunderheads
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solonist
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Peristaltic Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 3
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 24.3
Screen Interval: 14.3 to 24.3
Top of Casing Elevation: 4488.26
Depth to Groundwater: 17.98
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/25 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3

Sample 1510

start 14.38

Parameter	0 Mins 2 Min	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.4	0.5	0.4	0.4	0.4	0.4	0.4		1510
Water Depth		18.00	17.99	17.99	17.99	17.99	17.99		
Temperature	11.78	11.65	11.53	11.59	11.53	11.67	11.74		
pH	7.24	7.10	7.05	7.05	7.05	7.04	7.05		
Sp. Conductance	616	614	614	614	613	615	616		
DO	3.26	3.84	4.62	4.59	4.50	4.24	4.36		
Eh									
ORP	+100	+104	+119	+114	+116.8	+119	+121.1		
Turbidity	104	129	205	92.3	70.6	53.3	169.8		

Notes: Sample @ 1510 VOC 524.2

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/25/05
Weather: part cloudy 80's
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator:
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 6
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 12.6
Screen Interval: 2.6 to 12.6
Top of Casing Elevation: 4468.42
Depth to Groundwater: 3.91
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/25 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3
Sample 1600			

Started @ 1540

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate L/m	0.5	0.5	0.4	0.4	0.4				1600
Water Depth	3.92	3.91	3.91	3.91	3.91				
Temperature	12.74	11.96	12.16	12.19	12.20				
pH	7.38	7.13	6.98	6.98	6.98				
Sp. Conductance	432	427	426	426	426				
DO	4.83	3.46	3.10	3.29	3.12				
Eh									
ORP	+126	+138	+141	+140	+140				
Turbidity	44.2	44.9	38.1	37.9	37.7				

Notes: Sample @ 1600 VOC 524.2
pump stuck in well - rock jammed?

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/26/05
Weather: rain 70's
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: Solo-1.5 ?
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-88-13
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 40.5
Screen Interval: 30.5 to 40.5
Top of Casing Elevation: 4491.39
Depth to Groundwater: 23.53
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/26 0900
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
sample @ 1040			
L-dup @ 0800			3
MS/MSD			2

start @ 1020

Parameter	0 Mins 2 min	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate L/M	0.25	0.30	0.30						1040
Water Depth	23.54	23.54	23.54	2					
Temperature	11.71	11.68	11.58	11.51					
pH	6.49	6.52	6.67	6.66					
Sp. Conductance	461	461	460	459					
DO	2.68	2.22	1.84	1.79					
Eh									
ORP	+177	+174	+169	+167					
Turbidity	35.0	34.3	34.9	25.0					

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/26/05
Weather:
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solonist
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Peristaltic Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-6
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 40
Screen Interval: 30 to 40
Top of Casing Elevation: 4483.35
Depth to Groundwater: 23.03
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/26/15 0960
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers			
Analysis	**Bottle Type**	**Preservative**	**Number**
VOC - EPA 524.2	VOA	HCL	3
5 samples 1315			

start 12:55

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.2	0.25	0.25						1315
Water Depth	23.03	23.03	23.03	23.03					
Temperature	12.69	12.61	12.59	12.60					
pH	7.47	7.30	7.26	7.28					
Sp. Conductance	652	650	645	639					
DO	10.83	11.01	11.19	11.22					
Eh									
ORP	160.7	165.6	+164	+166					
Turbidity	13.4	3.5	3.5	1.5					

Notes: peristaltic produces sporadic bubbles- approx 3ft upstream of well. Well is not straight- can't get bailer down

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/26/05
Weather: cloudy
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-87-2
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 33.15
Screen Interval: 22.4 to 33.15
Top of Casing Elevation: 4494.94
Depth to Groundwater: 24.24
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/26/05 0900
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1

Sample @ 1430 6/26/05

Start - 14:05

Parameter	0 Mins 2 min	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.25	0.25	0.25	0.25	0.25				
Water Depth	24.22	24.24	24.23	24.23	24.23				
Temperature	13.08	13.44	13.42	13.35	13.32				
pH	6.98	6.80	6.76	6.77	6.76				
Sp. Conductance	609	615	614	613	613				
DO	2.42	2.06	1.79	1.73	1.72				
Eh									
ORP	+32.1	+12.4	+0.3	-8.0	-11.2				
Turbidity	1.8	1.2	0.4	0.4	1.0				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/26/05
Weather: cloudy, wind
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solinist
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-4
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 34.2
Screen Interval: 24.2 to 34.2
Top of Casing Elevation: 4489.86
Depth to Groundwater: 20.23
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/26/05 0900
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1
Sample @ 1545			

Start @ 15:13

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.35	0.35	0.35	0.2	0.3				
Water Depth	20.22	20.21	20.21	20.22	22.31				
Temperature	12.42	11.97	12.09	12.55	11.80				
pH	7.09	7.09	7.07	7.08	7.07				
Sp. Conductance	560	550	550	558	546				
DO	7.65	7.67	7.78	7.79	7.69				
Eh									
ORP	+80.5	+93.3	+97.4	+101.1	+103				
Turbidity	13.2	13.2	16.3	14.5	16.7				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/26/05
Weather: rain (60's)
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solonist
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-87-3
Monument Type: After Ground
Well Diameter: 2 inches
Total Casing Depth: 33.9
Screen Interval: 23.9 to 33.9
Top of Casing Elevation: 4485.95
Depth to Groundwater: 22.98
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/26/05 0900
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1

Sample 1640

Start 1614

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.25	0.25	0.25	0.25					
Water Depth	22.99	22.99	22.99	22.99					
Temperature	13.48	12.41	12.31	12.30					
pH	7.27	7.12	7.06	7.04					
Sp. Conductance									
DO	7.47	6.98	7.29	7.27					
Eh									
ORP	+124	+128	+131	+132					
Turbidity	34.8	35.2	35.2	35.4					

Notes:

Groundwater Monitoring Record	(Minimal Drawdown)	Kennedy/Jenks Consultants

Date: 0/20/05
Weather: rain
Project Name: Livingston
Project Number: 05
Sampling Personnel:
Water Level Indicator:
Purging Method:
Sampling Method:
Sampling Device:
Pump Intake Depth:
Water Disposal:

Well Number: L-87-3 Peristaltic
Monument Type:
Well Diameter:
Total Casing Depth:
Screen Interval:
Top of Casing Elevation:
Depth to Groundwater: 22.99
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:		0/20/05 0800
pH		↓
Eh:		
Spec. Conductance:		
Dissolved Oxygen:		
Turbidity:		
Other:		

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	
Equipment Blank	
Other	

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC	40 ml	HCl	3
sample @ 1700			
by order of AMY SIVERS - collect peristaltic sample after bladder pump sample for her comparison			

start @ 1659

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.5	0.3	0.25						
Water Depth	22.98	22.99	22.99						
Temperature	12.13	12.13	12.22						
pH	7.36	7.10	7.12						
Sp. Conductance	653	654	657						
DO	—	9.97	9.80						
Eh									
ORP	+139	+142	+144						
Turbidity	42.6	41.9	46.3						

Notes: some bubbles in line during purge.

Groundwater Monitoring Record (Minimal Drawdown) **Kennedy/Jenks Consultants**

Date:	06/26/05	Well Number:	92-1
Weather:	rain	Monument Type:	Above Ground
Project Name:	BNSF - Livingston	Well Diameter:	2 inches
Project Number:	0596021.16	Total Casing Depth:	32
Sampling Personnel:	mlg, jst	Screen Interval:	22 to 32
Water Level Indicator:	solonist	Top of Casing Elevation:	4498.51
Purging Method:	Minimal Drawdown	Depth to Groundwater:	22.63
Sampling Method:	as above	Groundwater Elevation:	
Sampling Device:	Bladder Pump	Wet Casing Volume:	
Pump Intake Depth:		Depth to NAPL:	
Water Disposal:	Drums	NAPL Thickness:	

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/26/05 0900
pH	YSI Multi	↓
Eh:	YSI Multi	↓
Spec. Conductance:	YSI Multi	↓
Dissolved Oxygen:	YSI Multi	↓
Turbidity:	hach	↓
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1
Sample @ 1800			
in hard rain			

Start @ [illegible] 1737

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.20	0.30	0.35	0.30	0.30				
Water Depth									
Temperature	12.46	12.45	12.01	12.08	12.05				
pH	7.37	7.36	7.29	7.27	7.27				
Sp. Conductance	552	558	550	547	547				
DO	10.64	9.38	9.09	9.10	9.11				
Eh									
ORP	+139	+148	+150	+151	+157				
Turbidity	34.8	37.1	[illegible]	36.8	35.6				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/27/05
Weather: cloudy
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 90-3
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 19.85
Screen Interval: 9.85 to 19.85
Top of Casing Elevation: 4463.32
Depth to Groundwater: 6.34
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/27/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1

Sample 0920

Start 0856

Parameter	0 Mins 3	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate L/m	0.45	0.20	0.25	0.25	0.25				
Water Depth	6.35	6.35	6.35	6.35	6.36				
Temperature	10.85	10.81	10.87	10.24	10.84				
pH	6.80	6.57	6.71	6.77	6.80				
Sp. Conductance	487	493	495	494	494				
DO	4.02	2.35	1.32	1.29	1.32				
Eh									
ORP	+202	+199	+188	+185	+184				
Turbidity	39.0	37.6	36.8	36.0	36.2				

5.73

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/27/05
Weather: Cloudy
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: Solinist
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: LS-11
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 16
Screen Interval: 6 to 16
Top of Casing Elevation: 4463.68
Depth to Groundwater: 4.66
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/27/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1
Sample ID 1020			

Parameter	0 Mins (3)	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.30	0.30	0.45	0.30					
Water Depth	4.65	4.66	4.67	4.67					
Temperature	11.26	11.20	11.21	11.25					
pH	7.16	7.06	7.03	7.03					
Sp. Conductance	505	503	503	504					
DO	1.67	1.19	1.08	1.09					
Eh									
ORP	+185	+187	+183	+180					
Turbidity	47.4	48.5	43.2	39.2					

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/27/05
Weather: in building
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: Solo
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-9
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 34.2
Screen Interval: 24.2 to 34.2
Top of Casing Elevation: 4496.41
Depth to Groundwater: 19.78
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/27/05 1300
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1
Sample @ 1150			

Start @ 1113

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.25	0.25	0.25						
Water Depth	19.78	19.78	19.79	19.78					
Temperature	11.04	11.01	10.99	11.00					
pH	7.22	7.16	7.18	7.20					
Sp. Conductance	403	403	402	402					
DO	7.53	7.17	7.36	7.34					
Eh									
ORP	+184	+186	184	+183					
Turbidity	36.9	36.4	35.9	35.4					

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/27/05
Weather: Building
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: SOLINIST
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Peristaltic Pump
Pump Intake Depth: 21.6
Water Disposal: Drums

Well Number: 89-8
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 25.5
Screen Interval: 15.5 to 25.5
Top of Casing Elevation: not measured
Depth to Groundwater: 18.35
Groundwater Elevation: 3.3
Wet Casing Volume: ≈ 1.6
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/27/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1

Sample @ 1250

Start @ 1228

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.25	0.20	0.20	0.20	0.20				
Water Depth	18.35	18.35	18.35	18.35	18.35				
Temperature	12.86	12.78	12.67	12.69	12.65				
pH	7.53	7.38	7.35	7.36	7.37				
Sp. Conductance	599	599	596	596	594				
DO	9.29	9.26	9.41	9.34	9.42				
Eh									
ORP	+180	+184	+185	+185	+184				
Turbidity	39.9	158	142	36.5	38.5				

Notes:
clean turbidity

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/ /05
Weather: Building
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solo
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-3
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 34
Screen Interval: 13 to 34
Top of Casing Elevation: 4496.1
Depth to Groundwater: 17.56
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/27 0800
pH	YSI Multi	↓ ↓
Eh:	YSI Multi	↓ ↓
Spec. Conductance:	YSI Multi	↓ ↓
Dissolved Oxygen:	YSI Multi	6/27/05 1300
Turbidity:	hach	↓ 1300
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1

Sample @ 1350

Start @ 1325

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.25	0.25	0.25	0.25	0.25				
Water Depth	17.56	17.56	17.56	17.56	17.56				
Temperature	11.50	11.26	10.78	10.76	10.78				
pH	7.53	7.41	7.29	7.29	7.29				
Sp. Conductance	395	394	390	390	390				
DO	8.40	8.33	8.41	8.50	8.49				
Eh									
ORP	+170	+176	+181	+181	+181				
Turbidity	36.1	36.5	35.9	35.0	35.0				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/27/05
Weather: cloudy
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: Solo
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 92-4
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 34.8
Screen Interval: 24.8 to 34.8
Top of Casing Elevation: 4490.23
Depth to Groundwater: 20.15
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	0800 6/27/05
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1
Sample @ 1615			

start 1535

Parameter	0 Mins	5 Mins (1)	10 Mins (5)	15 Mins (0)	20 Mins (0)	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.2	0.2	0.2	0.2	0.2				
Water Depth	20.15	20.15	20.14	20.15	20.15				
Temperature	14.60	12.92	12.86	12.87	12.72				
pH	7.36	7.30	7.26	7.24	7.23				
Sp. Conductance	610	587	572	565	560				
DO	5.24	6.88	7.24	8.32	8.54				
Eh									
ORP	159.4	161	162	164	164				
Turbidity	38.7	39.0	38.7	38.8	39.0				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/ /05
Weather:
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator:
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Peristaltic Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-87-5
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 29
Screen Interval: 19 to 29
Top of Casing Elevation: 4498.47
Depth to Groundwater: 23.32
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers			
Analysis	**Bottle Type**	**Preservative**	**Number**
VOC - EPA 524.2	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1
Sampled 1715			

1653

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.25	0.25	0.20	0.25	0.25				
Water Depth	23.31	23.32	23.32	23.32	23.32				
Temperature	13.28	13.13	12.92	12.52	12.52				
pH	7.58	7.31	7.23	7.20	7.19				
Sp. Conductance	477	467	464	459	461				
DO	6.48	6.15	6.17	6.09	6.17				
Eh									
ORP	+153	+156	+155	+155	+155				
Turbidity	9.2	14.8	50.7	52.3					

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/27/05
Weather: rain to clearing
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator: solo
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Peristaltic Pump
Pump Intake Depth: 27.8
Water Disposal: Drums

Well Number: 89-10
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 32.2
Screen Interval: 22.2 to 32.2
Top of Casing Elevation: 4484.07
Depth to Groundwater: 23.32
Groundwater Elevation: 4460.75
Wet Casing Volume: 27.8
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	6/27/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1

Sample ID 1815

Start @ 1849

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.2	0.2	0.2	0.2	0.2				
Water Depth	24.33	24.33	24.33	24.33	24.33				
Temperature	12.56	12.13	12.05	11.99	11.98				
pH	7.87	7.51	7.27	7.25	7.24				
Sp. Conductance	531	595	595	595	593				
DO	11.64	9.51	8.34	8.25	8.15				
Eh									
ORP	+133	+141	+147	+148	+148				
Turbidity	58.0	58.5	70.9	70.3	70.4				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 06/ /05
Weather:
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, jst
Water Level Indicator:
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-87-8
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 32.4
Screen Interval: 22.4 to 32.4
Top of Casing Elevation: 4493.37
Depth to Groundwater:
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3

Not sampled due to LNAPL in the well

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate									
Water Depth									
Temperature									
pH									
Sp. Conductance									
DO									
Eh									
ORP									
Turbidity									

Notes:

November 2005 Monitoring Event

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/16/05
Weather: Windy 38°F Cloudy
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg,rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-4
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 34.2
Screen Interval: 24.2 to 34.2
Top of Casing Elevation: 4489.86
Depth to Groundwater: 20.74
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/16/05 0900
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

Start 1415

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.5 →		0.4	0.4	0.4				
Water Depth	20.74 →		20.74	20.74	20.74				
Temperature	11.31 →		11.37	11.31	11.23				
pH	7.30 →		7.25	7.23	7.21				
Sp. Conductance	532 →		536	536	535				
DO	7.39 →		6.42	6.93	6.94				
Eh									
ORP	+177 →		+176	+177	+176				
Turbidity	15.7 →		15.8	15.5	15.5				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/16/05
Weather: Windy, Cloudy 38°F
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg,rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-88-10
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 31
Screen Interval: 21 to 31
Top of Casing Elevation: 4483.56
Depth to Groundwater: 24.00
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/16/05 0900
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

Start 1222

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.3	0.3	0.3	0.3	0.3				
Water Depth	24.1	24.1	24.1	24.0	24.0				
Temperature	11.0	11.05	11.35	11.31	11.26				
pH	7.10	7.10	7.09	7.09	7.07				
Sp. Conductance	527	528	535	535	505				
DO	1.98	1.60	1.70	1.88	1.62				
Eh									
ORP	+159	+155	+153	+152	+152				
Turbidity	16.6	16.5	16.5	16.4	16.4				

Notes:
Sampled @ 1250

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/16/05
Weather: Windy, Ptly Cloudy 34°F
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 94-2
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 39.2
Screen Interval: 29.2 to 39.2
Top of Casing Elevation: 4459.05
Depth to Groundwater: 8.20
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/16 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 524.2	VOA	HCL	3
Start 0931			

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate		0.3	0.3	0.4	0.4	0.4			
Water Depth		8.2	8.2	8.22	8.2	8.2			
Temperature		9.98	9.17	9.16	9.95	9.97			
pH		7.19	7.23	7.24	7.22	7.21			
Sp. Conductance		347	330	358	358	358			
DO		3.02	2.87	3.30	3.37	3.31			
Eh		+150 ↓							
ORP			+146	+142	+142	+142			
Turbidity		17.2	17.2	17.2	17.2	17.2			

Notes: 8.2 8.2 Sampled @ 1000

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/16/05
Weather: Windy Ptly Cloudy 38°F
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 92-2
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 27
Screen Interval: 17 to 27
Top of Casing Elevation: 4461.29
Depth to Groundwater: 5.78
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/16 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

Start 1052

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.3	0.4	0.4	0.4	0.4	0.4	0.4		
Water Depth		5.78	5.79	5.79	5.79	5.79	5.79		
Temperature		10.64	10.65	10.69	10.75	10.79	10.74		
pH		7.24	7.19	7.20	7.19	7.18	7.18		
Sp. Conductance		+525	537	533	504	508	517		
DO *		5.41	5.28	7.49	5.91	5.55	6.11		
Eh									
ORP		+149	+150	+142	+124	+117	+112		
Turbidity		16.6	16.5	16.3	16.4	16.4	16.2		

Notes: * DO, QUESTIONABLE, WELL ROOTED IN!

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/17/05
Weather: Sunny, Calm 34°F
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Peristaltic Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-87-5
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 29
Screen Interval: 19 to 29
Top of Casing Elevation: 4498.47
Depth to Groundwater: 23.80
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/17/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

Start 0913

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.45	0.45	0.45	0.45	0.4				
Water Depth	23.79	23.80	23.80	23.80	23.80				
Temperature		11.00	11.13	11.21	11.12				
pH		6.64	6.97	6.96	7.00				
Sp. Conductance		572	572	572	567				
DO		7.14	6.83	7.48	7.48				
Eh									
ORP		+208	+204	+202	+201				
Turbidity		18.0	18.0	19.0	17.4				

Notes:
Sample Depth - 27 ft. Sample Time 0945

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/17/05
Weather: Sunny 35°F
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 90-3
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 19.85
Screen Interval: 9.85 to 19.85
Top of Casing Elevation: 4463.32
Depth to Groundwater: 10.14
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/17/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

start 1004

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.45	0.40	0.40	0.40	0.40				
Water Depth									
Temperature		10.62	10.90	10.94	10.93				
pH		7.11	7.10	7.07	7.08				
Sp. Conductance		675	674	671	670				
DO		4.63	3.72	3.97	3.96				
Eh									
ORP		+204	+200	+200	+200				
Turbidity		~~29.0~~ 20.2	19.2	21.0	18.9				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/17/05
Weather: Sunny 37°F Calm
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: GeoProbe
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: L-87-2
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 33.15
Screen Interval: 22.4 to 33.15
Top of Casing Elevation: 4494.94
Depth to Groundwater: 24.76
Groundwater Elevation: 24
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/17/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

Start 1113

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.30	0.3	0.3	0.3	0.3				
Water Depth		24.77							
Temperature		11.15	11.11	11.66	11.73				
pH		6.99	6.95	6.95	6.99				
Sp. Conductance		617	610	605	609				
DO		2.36	2.12	1.60	1.49				
Eh									
ORP		+35.2	+24.7	+17.6	+9.6				
Turbidity		18.2	18.1	18.0	18.0				

Notes: Bubbles prevalent
Sample Time 1145

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/17/05
Weather: Indoors
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Peristaltic Pump
Pump Intake Depth: 23.0
Water Disposal: Drums

Well Number: 89-8
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 25.5
Screen Interval: 15.5 to 25.5
Top of Casing Elevation: not measured
Depth to Groundwater: 19.00
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	0800 11/17/05
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
Methane, Ethane, Ethene - RSK175	VOA	HCL	3
DOC - EPA 415.1	1 L Amber	unpreserved	1

Start 1324 1334 1344

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate (L)		0.4	0.4	0.4	0.4				
Water Depth		19.00	19.00	19.00	19.00				
Temperature		12.58	12.67	12.66	12.67				
pH		7.38	7.35	7.31	7.31				
Sp. Conductance		740	741	742	742				
DO		2.61	2.92	3.15	3.20				
Eh									
ORP		+132	+135	+138.5	+139				
Turbidity		15.1	14.9	16.1	15.8				

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/17/05
Weather: indoors
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Sol.inst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-9
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 34.2
Screen Interval: 24.2 to 34.2
Top of Casing Elevation: 4496.41
Depth to Groundwater: 20.29
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/17/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

Parameter	0 Mins (1414)	5 Mins	10 Mins (1424)	15 Mins (1434)	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.5	0.4	0.4	0.4					
Water Depth	20.29	20.29	20.29	20.29					
Temperature		11.81	11.59	11.57					
pH		7.26	7.25	7.27					
Sp. Conductance		554	554	554					
DO		2.08	2.21	2.30					
Eh		+150	+151	+151					
ORP									
Turbidity		15.6	15.3	15.0					

Notes:

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/17/05
Weather: Indoors
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 89-3
Monument Type: Below Ground
Well Diameter: 2 inches
Total Casing Depth: 34
Screen Interval: 13 to 34
Top of Casing Elevation: 4496.1
Depth to Groundwater: 18.12
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/17/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	MW-200
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3
MW-100 0800			3
MS/MSD			4

1615 1620 1625 1630 1635

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.4	0.4	0.4	0.4	0.4				
Water Depth		18.12	18.13	18.13	18.13				
Temperature		11.15	11.13	11.16	11.15				
pH		7.29	7.30	7.31	7.32				
Sp. Conductance		547	547	547	547				
DO		1.72	2.02	2.22	2.28				
Eh									
ORP		+180.2	+178.8	+178.6	+177				
Turbidity		16.2	17.6	7.4 15.6					

Notes: Collect MS and MSD

Sample Time 1645

Groundwater Monitoring Record (Minimal Drawdown) — Kennedy/Jenks Consultants

Date: 11/18/05
Weather: Windy, overcast 33°F
Project Name: BNSF - Livingston
Project Number: 0596021.16
Sampling Personnel: mlg, rgh
Water Level Indicator: Solinst
Purging Method: Minimal Drawdown
Sampling Method: as above
Sampling Device: Bladder Pump
Pump Intake Depth:
Water Disposal: Drums

Well Number: 92-1
Monument Type: Above Ground
Well Diameter: 2 inches
Total Casing Depth: 32
Screen Interval: 22 to 32
Top of Casing Elevation: 4498.51
Depth to Groundwater: 23.11
Groundwater Elevation:
Wet Casing Volume:
Depth to NAPL:
NAPL Thickness:

Water Quality Meter(s)	Model	Calibration Date/Time
Temperature:	YSI Multi	11/18/05 0800
pH	YSI Multi	
Eh:	YSI Multi	
Spec. Conductance:	YSI Multi	
Dissolved Oxygen:	YSI Multi	
Turbidity:	hach	
Other:	none	

Gallons per Foot of Well Casing:
2-inch = 0.16 gal/ft 4-inch = 0.64 gal/ft
6-inch = 1.44 gal/ft

QA/QC Samples	
Type	**Sample ID**
Blind Duplicate	
Trip Blank	With Batch
Equipment Blank	None
Other	None

Sample Containers

Analysis	Bottle Type	Preservative	Number
VOC - EPA 8260	VOA	HCL	3

0817 0857

Parameter	0 Mins	5 Mins	10 Mins	15 Mins	20 Mins	25 Mins	30 Mins	35 Mins	Sample Time
Flow Rate	0.5	0.4	0.4	0.4	0.4				
Water Depth	23.11	23.11	23.12	23.12	23.12				
Temperature		11.29	10.98	11.06	11.44				
pH		6.92	7.00	7.03	7.09				
Sp. Conductance		650	653	648	649				
DO		6.15	6.99	6.82	6.85				
Eh									
ORP		237	227.6	220.1	219.2				
Turbidity		29.1	19.9	24.0	23.6				

Notes:
Sample Taken @ 0915

Kennedy/Jenks Consultants
21 First Street NW
Choteau, Montana 59422
406-466-5930

Receipt for Samples

On behalf of BNSF Railway Company, Kennedy/Jenks Consultants is acquiring the sample(s) listed below in accordance with Burlington Northern Livingston Shop Complex Statement of Work. This work is being conducted as part of the remedial design/remedial action (RD/RA) activities at the Burlington Northern Livingston Shop Complex Facility in Livingston, Montana, which is being performed in accordance with Montana's Comprehensive Environmental Responsibility and Cleanup Act (CERCA).

Property Owner/Operator Information

Name Larry Winstel
Physical Address of Property Sampled 408 N. K St.
Mailing Address same
Phone (optional) 406 222 8795

The following samples have collected from this property:

Date	Media	Sample ID Number	Analysis to be Preformed
11/18/05	water	408 N K. St (12BR03)	VOC ~~8260~~ 524.2

The above referenced samples have been collected in accordance with the statement of work:

☐ Without variation, or ☒ With the following variations from the plan:
grab groundwater with bailer from well

The property owner/operator was offered a portion of the sample taken (split sample) at the person's cost. The property owner/operator elected to:

☐ Accept a split sample,or ☒ Decline a split sample.

The Montana Department of Environmental Quality (DEQ) will mail the sampling results to the person identified above when they become available. The DEQ project officer for this work is Ms. Amy Sivers (telephone 406-841-5068).

Copy of this receipt is provided to property owner/operator.

KJ Representative:

Signature — Printed Name: Matthew L. Gibson

Date: 11/18/05